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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/544,109

08/02/2005

Hirokatsu Miyata

03500.103094

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03/19/2008

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EXAMINER

DESAI, ANISH P

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

03/19/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/544,109	<b>Applicant(s)</b> MIYATA ET AL.	
	<b>Examiner</b> ANISH DESAI	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 December 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 6-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 17 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Applicant's arguments in response to the Office action dated 09/14/07 have been fully considered.
2. Claims 1-18 are pending. Claims 6-13 are withdrawn. Claims 17 and 18 are new claims. Support for amended and new claims is found in the specification.
3. All of the previously made 35 USC Section 112-first and second paragraph rejections are withdrawn in view of the present amendment and response.
4. All of the art rejections are maintained.

### ***Claim Rejections - 35 USC § 102/103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 5, 15, 17, and 18 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over article by Besson et al., *A New 3D*

*Organization of Mesopores in Oriented CTAB Silica Films*, J. Phys. Chem. B 2000, 104, pp. 12095-12097, substantially as set forth in the previous Office Action.

Besson discloses highly organized and textured cetyltriethylammonium bromide (CTAB) surfactant (amphiphilic molecular assemblies) templated silica films that have a 3D- hexagonal packing of spherical micelles (separated by polymeric silica walls (inorganic material) (abstract). The spherical micelles are formed of surfactant (amphiphilic molecular assemblies) (see page 12095), and the pores (holes) of the mesoporous silica films of Besson are periodically arranged (regularly arranged) and have 3D pore network (see page 12095). The films are synthesized by depositing the film forming solution by spin coating on glass plates (substrate) (see page 12095). The films of Besson are CTAB templated silica films with a 3D hexagonal symmetry (see page 12097).

Regarding claims 1, 5, 15, 17, and 18 Besson discloses what has been set forth above except for the local periodic structure in a section in parallel with the substrate of the film has a 6-fold axis perpendicular to a film plane and symmetric reflective surfaces of the structure including the 6-fold axis are facing in the same direction across the entire film, the arrangement of the amphiphilic molecular assemblies has a 6-fold axis, and the planes of mirror symmetry containing the symmetry axis are parallel throughout the film. However, it is reasonable to presume that these features would necessarily present in the mesoporous silica film of Besson. It is noted that the aforementioned features of the claimed invention are determined using X-ray diffraction analysis once the film structure is formed (see 0045 of US Patent Application Publication 2006/0204758A1 of the presently claimed invention). As shown above in this Office Action, the structures of the film of the presently claimed invention and that of Besson are same.

Additionally, it is noted that the film of Applicant and that of Besson are generally formed using same method. For Example, Applicant has stated “The mesostructured silica film can be formed by retaining the substrate in an aqueous solution containing a surfactant which is an amphiphilic molecule, silicon alkoxide which is a silica source, and an acid serving as a hydrolysis catalyst. On the substrate, surfactant micelles which are amphiphilic molecular assemblies and an alkoxide precursor which is produced through hydrolysis and is a silica precursor form a mesostructured silica film regularly arranged through self-assembly.” (0039 of Patent Application Publication US 2006/0204758A1 of the presently claimed invention). The process of forming the films of Besson’s invention is described on page 12095 and it is similar to that of Applicant’s process. Thus, it is the Examiner’s position that the aforementioned features would have been present in the Besson’s invention. The burden is upon Applicant to prove it otherwise (see *In re Fitzgerald*, 205 USPQ 594). In addition, the presently claimed features would obviously have been present once the film of Besson is provided (see *In re Best*, 195 USPQ at 433, footnote 4 CCPA 1977).

6. Claims 2-4 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Besson et al. *A New 3D Organization of Mesopores in Oriented CTAB Silica Films*, J. Phys. Chem. B 2000, 104, pp. 12095-12097 as applied to claim 1 above, and further in view of Liu et al. (US 2002/0034626A1), substantially as set forth in the previous Office Action.

Regarding the preamble of “X-ray optical device” of claim 14, this claim does not set forth any structure associated with the X-ray optical device, except reciting “X-ray optical device” in the preamble, thus it is the Examiner’s position that the film of Besson as applied to claim 1 is functionally capable of being used with a X-ray optical device.

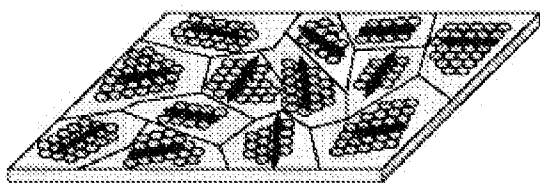
Besson is silent with respect to teaching amphiphilic molecular assemblies comprising surfactant micelles containing two or more nonionic surfactants of different molecular length, wherein each surfactant has identical hydrophobic portions but hydrophilic polyethylene oxide portions are different in molecular chain length. However, Liu discloses a mesoporous silica film having a low dielectric constant and a wafer coated with such a mesoporous silica film (abstract). The invention of Liu has utility in the fields of semiconductor devices, low dielectric constant coatings on fibers and other structures, and in catalytic supports (0008). The primary reference of Besson's invention is noted to be useful in the fields of catalysis, filtration etc. (page 12095 of Besson). Further paragraphs 0055-0056 of Liu disclose various nonionic surfactants that are used in the formation of the mesoporous film of Liu's invention. These surfactants of Liu contain polyethylene oxide and can be used in combinations (0056). Additionally, Liu discloses mixture of surfactants such as C12EO10 and C12EO4 (0040,0056), which reads on two or more nonionic surfactants of different molecular length with identical hydrophobic portions and different chain lengths of polyethylene oxide. The films of Liu have thickness uniformity, minimum surface texture, and mechanical integrity (0022). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use surfactants as taught by Liu in the invention of Besson, motivated by the desire to form a film having thickness uniformity and mechanical integrity.

### ***Response to Arguments***

7. Applicant's arguments filed 12/14/07 have been fully considered but they are not persuasive.

With respect to the art rejections based on Besson et al., Applicant argues that while the film of Besson locally has 6-fold symmetrical structure, the arrangement is not regulated across the entire film. Additionally, Applicant has provided a schematic and stated that "The mesoporous silica thin film in the cited Besson, et al. article can be schematically illustrated in the following drawing". Further, Applicant states that the electron micrograph "b" of the diffraction pattern of Besson clearly shows that domains different from the direction of the symmetric mirror planes of 6-fold symmetry are present in the film. The Examiner respectfully disagrees for the following reasons:

It is respectfully submitted that the Examiner is unsure as to how Applicant arrives at the schematic shown below in the response.



Further it is noted that Besson discloses "From Figure 2a, it can be concluded that the organization process takes place over the whole film thickness and the staking is perfect from the glass/film to the film/air interfaces." This disclosure of Besson appears to contradict Applicant's assertion of random orientation of mesostructure in Besson's invention. Additionally, it is not understood as to how Applicant concludes from Figure 1(b) of Besson that domains different from the direction of the symmetric mirror planes of 6-fold symmetry are present in the film. Applicant is respectfully requested to further elaborate as to how he/she achieves the symmetric reflective surface of the structure including six-fold axis facing in the same direction across the

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entire film. The explanation from Applicant can help in understanding the invention. It is also noted that Besson discloses two different 3D architectures are known and appear in their product. It appears from the discussion that each type is aligned but they are not aligned with each other. It is not clear that the instant claim language precludes this formation.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANISH DESAI whose telephone number is (571)272-6467. The examiner can normally be reached on Monday-Friday, 8:00AM-4:30PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. D./  
Examiner, Art Unit 1794

/Terrel Morris/  
Supervisory Patent Examiner  
Group Art Unit 1794

<div>Application Number</div> <div></div>	Application/Control No.	Applicant(s)/Patent under Reexamination	
	10/544,109	MIYATA ET AL.	
	Examiner	Art Unit	
	ANISH DESAI	1794	